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Flight Operations Digital Documentation

Presentation to the
NASA/FAA Operating Documents Workshop V
San Diego, CA
July 24-25

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Background / History

» 1998:

- AOM/FCOM & QRH documents assembled from multiple source:
  - Manufacturers paper copies
  - WordPerfect 5.1 DOS files
  - Some Word & Excel files
  - Images scanned from other documents
- Documents were produced on 8 _” x 11” paper.

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Background / History

- 7 Aircraft types to maintain:
  - A319/A320, A340, A330 (being introduced)
  - B767, B747, DC-9
  - CRJ

» ***NO COMMON DOCUMENT STRUCTURE…***

- All 3 Manufacturers supplied their documents in different structure and format.

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	Airbus	Boeing	Bombardier
AOM/FCOM			
Volume 1	**Systems** **(Arranged by ATA Spec.)**	**Limitations** **Normal & Supp Procedures**	**Systems** **(Arranged Alphabetically)**
Volume 2	**Loading, Perf., Special Ops, Flight Planning**	**Systems** **(Arranged Alphabetically)**	**Limitations, Checklist, Procedures, Perf., Special Ops**
Volume 3 & Volume 4	**Limitations, Abnormal, Procedures, In-Flight Perf., FMGS Guide**		
Paper Format	5.83” x 8.27” (A5)	5.5” x 8.5”	8.5” x 11”
QRH	Emergency, Abnormals	All Non-Normals All Performance	Warnings Cautions

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Our Goals

- Standardize the deliverables (Structure & Format)
- Improve the quality of the documentation by having increase control of the content
- Prepare for upcoming needs and be able to decrease the turn around time of revisions
- Improve the delivery medium
- Comply with future ATA documentation standards
- Keep cost at a minimum

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Steps Taken…

» 2 Major efforts:

- Re-structuring of all AOM/FCOM documents to an Air Canada standard using ATA numbering (first 2 digits only) and POF standards.

- Convert all the legacy documents to a single authoring and publishing platform.
  - FrameMaker+SGML was chosen because of the ability to get both Airbus and Boeing documents in this format.

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Steps Taken…

- The restructuring and conversion of the 7 different manuals took approximately 1 year.
- The release of the Initial Issue of the manuals was done on paper. This was done to familiarize the pilots with the new layout and structure before making any other changes.
- The FODD CD-ROM Application was introduced with the subsequent release.

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The FODD Application

- Characteristics:
  - Document Viewer utilizing PDF Technology
  - Database driven navigation
  - Data Search capabilities
  - Linking of ATA & POF related information

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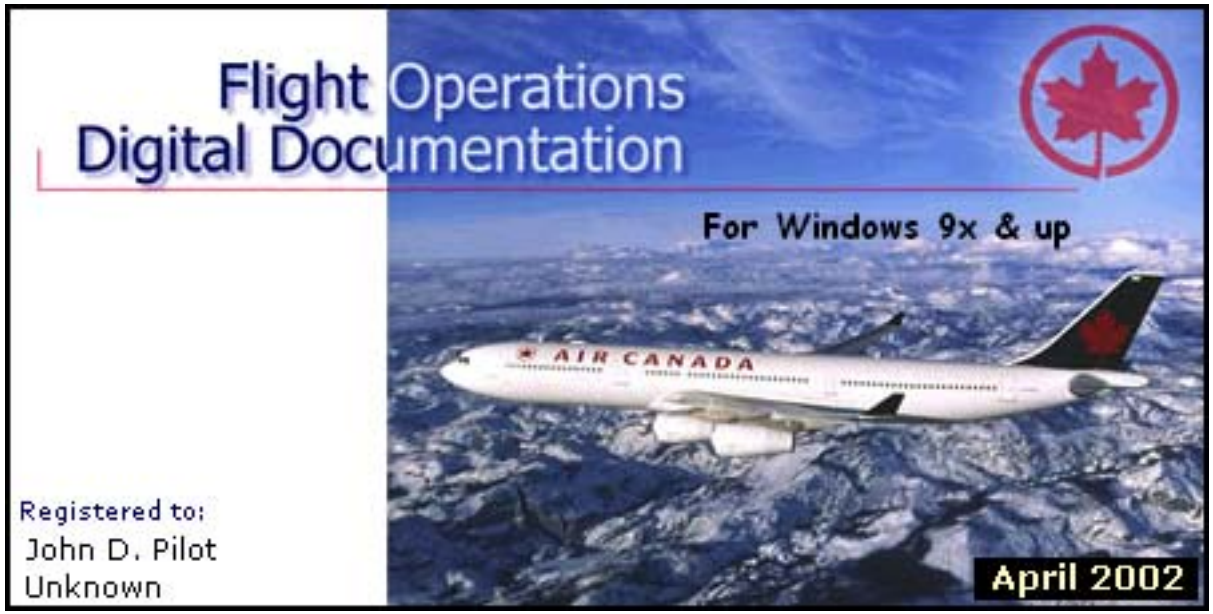
The FODD Application



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FODD [A319/A320/A321 - Aircraft Operating Manual]

Flight Operations Digital Documentation

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Airbus - A319/A320/A321 ◀ Select an aircraft type. Effective: April 2002 ? EXIT

CONTENT SEARCH

- Aircraft Operating Manual - A319/A320/A321
  - Volume 1
  - Volume 2
- Flight Crew Training Manual - A319/A320/A321
- FMGS Pilot's Guide - A319/A320/A321
- Minimum Equipment List - A319/A320/A321
- Flight Operations Manual

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A319 / A320 / A321

Aircraft Operating Manual

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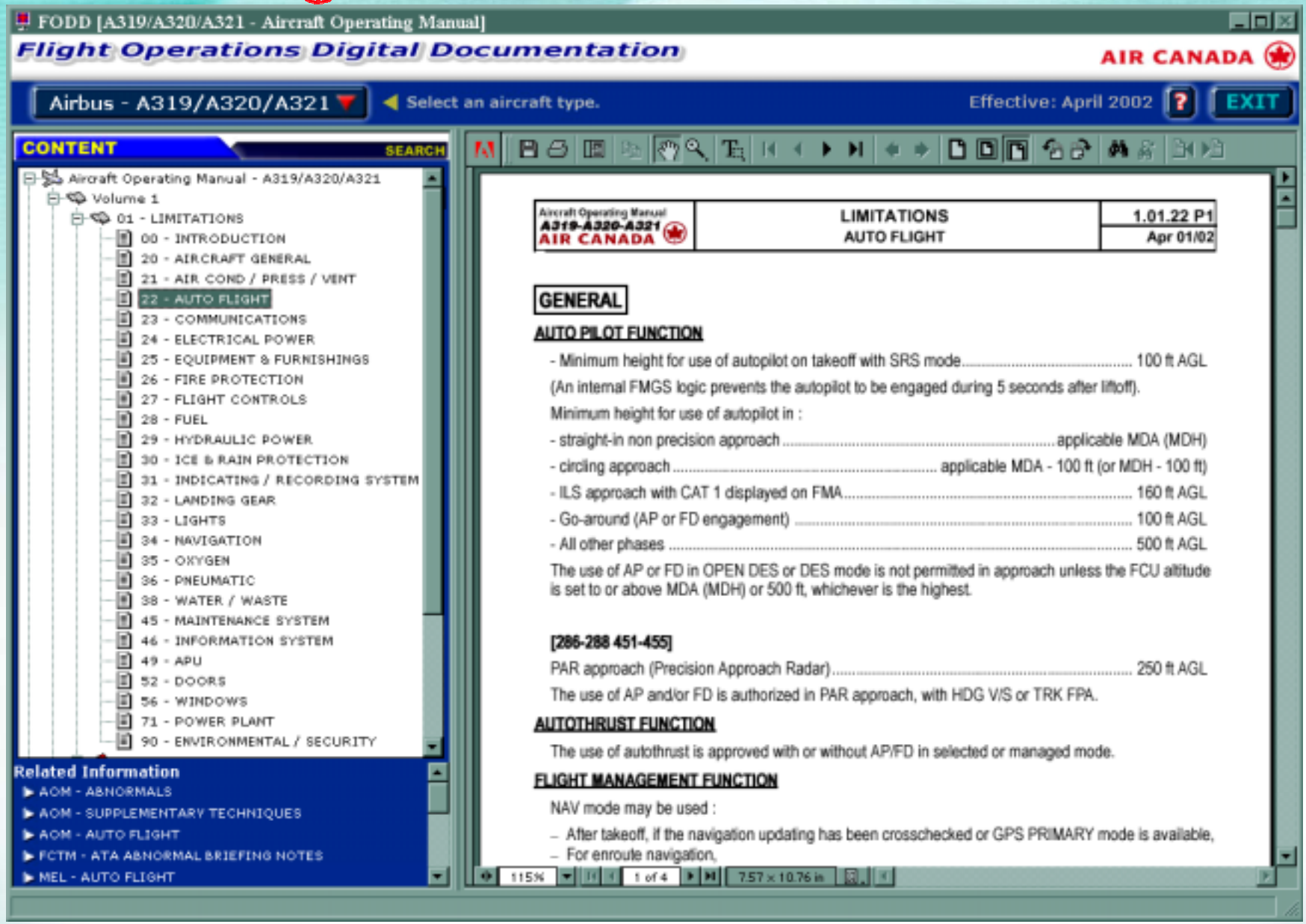
FODD [A319/A320/A321 - Aircraft Operating Manual]
Flight Operations Digital Documentation
AIR CANADA
Airbus - A319/A320/A321
Select an aircraft type.
Effective: April 2002
EXIT
CONTENT
SEARCH
Aircraft Operating Manual - A319/A320/A321
Volume 1
01 - LIMITATIONS
00 - INTRODUCTION
20 - AIRCRAFT GENERAL
21 - AIR COND / PRESS / VENT
22 - AUTO FLIGHT
23 - COMMUNICATIONS
24 - ELECTRICAL POWER
25 - EQUIPMENT & FURNISHINGS
26 - FIRE PROTECTION
27 - FLIGHT CONTROLS
28 - FUEL
29 - HYDRAULIC POWER
30 - ICE & RAIN PROTECTION
31 - INDICATING / RECORDING SYSTEM
32 - LANDING GEAR
33 - LIGHTS
34 - NAVIGATION
35 - OXYGEN
36 - PNEUMATIC
38 - WATER / WASTE
45 - MAINTENANCE SYSTEM
46 - INFORMATION SYSTEM
49 - APU
52 - DOORS
56 - WINDOWS
71 - POWER PLANT
90 - ENVIRONMENTAL / SECURITY
Related Information
AOM - ABNORMALS
AOM - SUPPLEMENTARY TECHNIQUES
AOM - AUTO FLIGHT
FCTM - ATA ABNORMAL BRIEFING NOTES
MEL - AUTO FLIGHT
Aircraft Operating Manual
A319-A320-A321
AIR CANADA
LIMITATIONS
AUTO FLIGHT
1.01.22 P1
Apr 01/02
GENERAL
AUTO PILOT FUNCTION
- Minimum height for use of autopilot on takeoff with SRS mode ..... 100 ft AGL
(An internal FMGS logic prevents the autopilot to be engaged during 5 seconds after liftoff).
Minimum height for use of autopilot in :
- straight-in non precision approach ..... applicable MDA (MDH)
- circling approach ..... applicable MDA - 100 ft (or MDH - 100 ft)
- ILS approach with CAT 1 displayed on FMA ..... 160 ft AGL
- Go-around (AP or FD engagement) ..... 100 ft AGL
- All other phases ..... 500 ft AGL
The use of AP or FD in OPEN DES or DES mode is not permitted in approach unless the FCU altitude is set to or above MDA (MDH) or 500 ft, whichever is the highest.
[286-288 451-455]
PAR approach (Precision Approach Radar) ..... 250 ft AGL
The use of AP and/or FD is authorized in PAR approach, with HDG V/S or TRK FPA.
AUTOTHRUST FUNCTION
The use of autothrust is approved with or without AP/FD in selected or managed mode.
FLIGHT MANAGEMENT FUNCTION
NAV mode may be used :
– After takeoff, if the navigation updating has been crosschecked or GPS PRIMARY mode is available,
– For enroute navigation,
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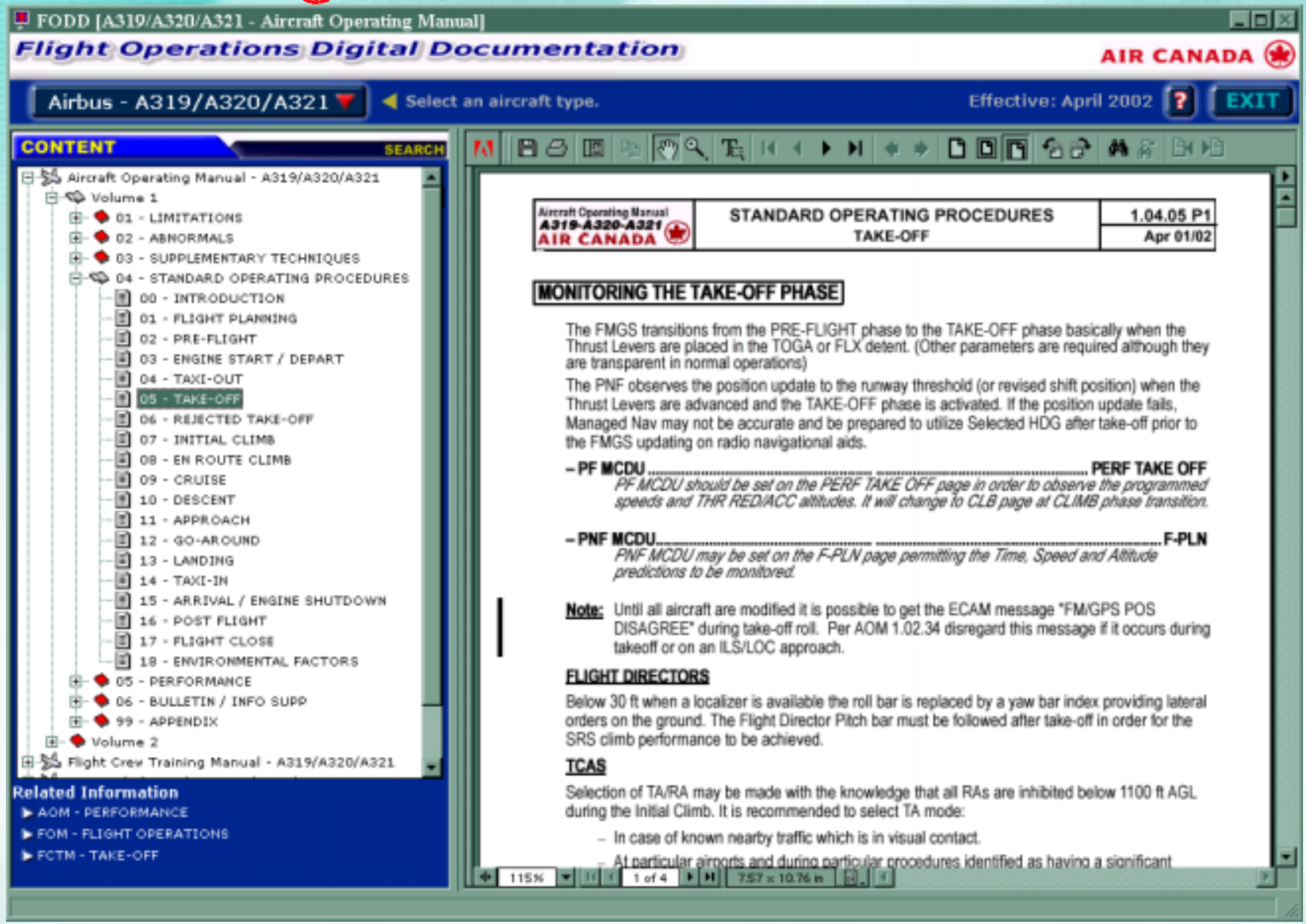
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Flight Operations Digital Documentation
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Airbus - A319/A320/A321
Select an aircraft type.
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EXIT
CONTENT
SEARCH
Aircraft Operating Manual - A319/A320/A321
Volume 1
01 - LIMITATIONS
02 - ABNORMALS
03 - SUPPLEMENTARY TECHNIQUES
04 - STANDARD OPERATING PROCEDURES
00 - INTRODUCTION
01 - FLIGHT PLANNING
02 - PRE-FLIGHT
03 - ENGINE START / DEPART
04 - TAXI-OUT
05 - TAKE-OFF
06 - REJECTED TAKE-OFF
07 - INITIAL CLIMB
08 - EN ROUTE CLIMB
09 - CRUISE
10 - DESCENT
11 - APPROACH
12 - GO-AROUND
13 - LANDING
14 - TAXI-IN
15 - ARRIVAL / ENGINE SHUTDOWN
16 - POST FLIGHT
17 - FLIGHT CLOSE
18 - ENVIRONMENTAL FACTORS
05 - PERFORMANCE
06 - BULLETIN / INFO SUPP
99 - APPENDIX
Volume 2
Flight Crew Training Manual - A319/A320/A321
Related Information
AOM - PERFORMANCE
FOM - FLIGHT OPERATIONS
FCTM - TAKE-OFF
Aircraft Operating Manual A319-A320-A321 AIR CANADA
STANDARD OPERATING PROCEDURES
TAKE-OFF
1.04.05 P1
Apr 01/02
MONITORING THE TAKE-OFF PHASE
The FMGS transitions from the PRE-FLIGHT phase to the TAKE-OFF phase basically when the Thrust Levers are placed in the TOGA or FLX detent. (Other parameters are required although they are transparent in normal operations)
The PNF observes the position update to the runway threshold (or revised shift position) when the Thrust Levers are advanced and the TAKE-OFF phase is activated. If the position update fails, Managed Nav may not be accurate and be prepared to utilize Selected HDG after take-off prior to the FMGS updating on radio navigational aids.
– PF MCDU ..... PERF TAKE OFF
PF MCDU should be set on the PERF TAKE OFF page in order to observe the programmed speeds and THR RED/ACC altitudes. It will change to CLB page at CLIMB phase transition.
– PNF MCDU ..... F-PLN
PNF MCDU may be set on the F-PLN page permitting the Time, Speed and Altitude predictions to be monitored.
Note: Until all aircraft are modified it is possible to get the ECAM message "FM/GPS POS DISAGREE" during take-off roll. Per AOM 1.02.34 disregard this message if it occurs during takeoff or on an ILS/LOC approach.
FLIGHT DIRECTORS
Below 30 ft when a localizer is available the roll bar is replaced by a yaw bar index providing lateral orders on the ground. The Flight Director Pitch bar must be followed after take-off in order for the SRS climb performance to be achieved.
TCAS
Selection of TA/RA may be made with the knowledge that all RAs are inhibited below 1100 ft AGL during the Initial Climb. It is recommended to select TA mode:
– In case of known nearby traffic which is in visual contact.
– At particular airports and during particular procedures identified as having a significant
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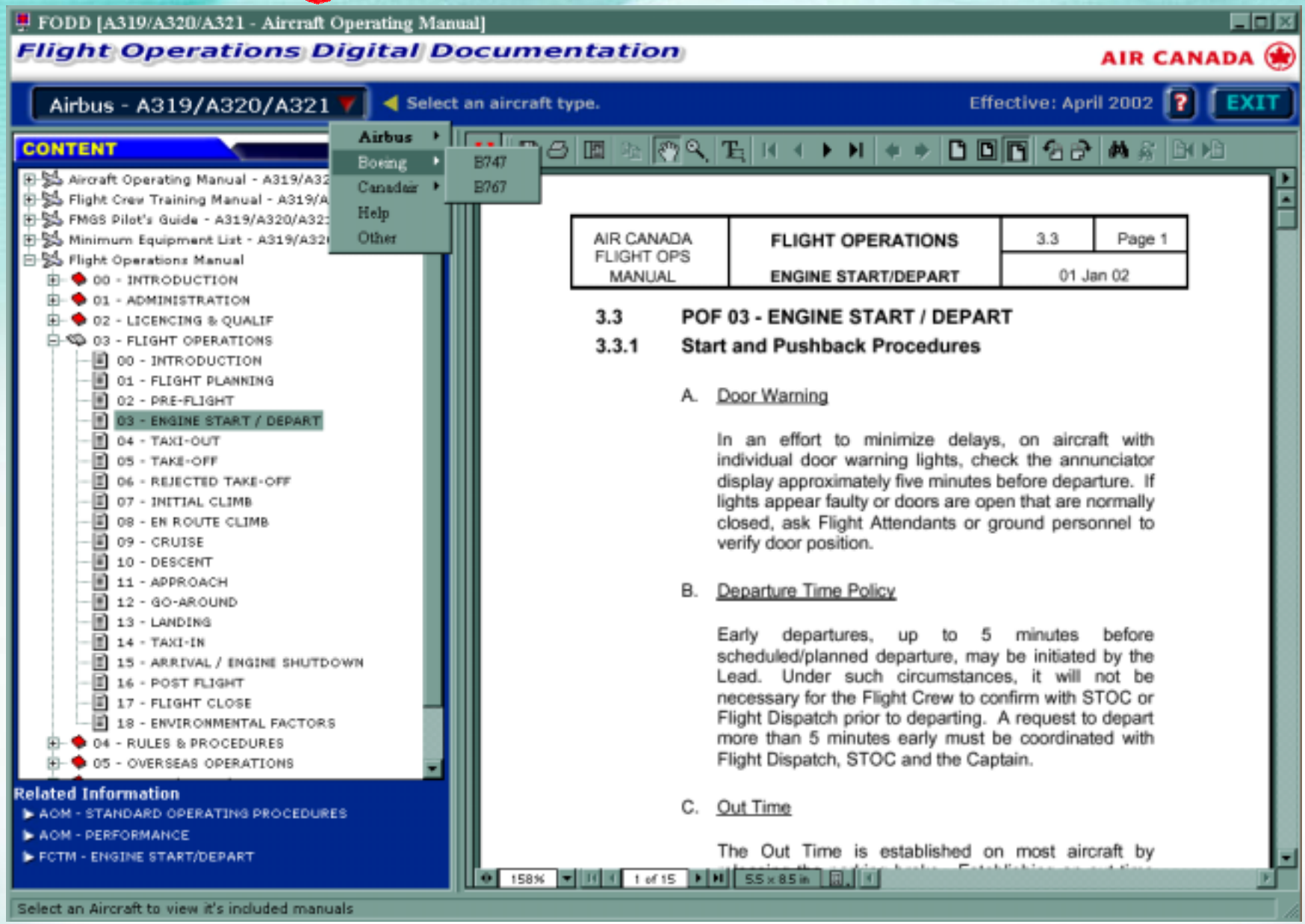
FODD [A319/A320/A321 - Aircraft Operating Manual]
Flight Operations Digital Documentation
AIR CANADA
Airbus - A319/A320/A321
Select an aircraft type.
Effective: April 2002
EXIT
CONTENT
Airbus
Boeing
Canadair
Help
Other
B747
B767
Aircraft Operating Manual - A319/A32
Flight Crew Training Manual - A319/A
FMGS Pilot's Guide - A319/A320/A32
Minimum Equipment List - A319/A32
Flight Operations Manual
00 - INTRODUCTION
01 - ADMINISTRATION
02 - LICENCING & QUALIF
03 - FLIGHT OPERATIONS
00 - INTRODUCTION
01 - FLIGHT PLANNING
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16 - POST FLIGHT
17 - FLIGHT CLOSE
18 - ENVIRONMENTAL FACTORS
04 - RULES & PROCEDURES
05 - OVERSEAS OPERATIONS
Related Information
AOM - STANDARD OPERATING PROCEDURES
AOM - PERFORMANCE
FCTM - ENGINE START/DEPART
AIR CANADA FLIGHT OPS MANUAL
FLIGHT OPERATIONS
ENGINE START/DEPART
3.3
Page 1
01 Jan 02
3.3 POF 03 - ENGINE START / DEPART
3.3.1 Start and Pushback Procedures
A. Door Warning
In an effort to minimize delays, on aircraft with individual door warning lights, check the annunciator display approximately five minutes before departure. If lights appear faulty or doors are open that are normally closed, ask Flight Attendants or ground personnel to verify door position.
B. Departure Time Policy
Early departures, up to 5 minutes before scheduled/planned departure, may be initiated by the Lead. Under such circumstances, it will not be necessary for the Flight Crew to confirm with STOC or Flight Dispatch prior to departing. A request to depart more than 5 minutes early must be coordinated with Flight Dispatch, STOC and the Captain.
C. Out Time
The Out Time is established on most aircraft by
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1 of 15
55 x 85 in
Select an Aircraft to view it's included manuals

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Future Development Plans

- Continue to support Paper delivery
- Continue Support of CD delivery
- Introduce Web delivery
  - Initial viewer to continue using PDF
  - Later versions to take advantage of XML
- Migrate all documents to a electronic document management system providing the ability to produce any desired output.
  - This step will happen only when the ATA Flight Operation Documentation interchange standard is made available.